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(56) Documents Cited

GB 2098861 A

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US 4589316 A

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(54) Washable floor mats with perforated water-impermeable backing

(57) In a washable floor mat having a perforated backing (10) of resilient water-impermeable material, projections and/or recesses (13) are provided extending around some or all of the holes (12). This arrangement provides lips which close the holes under pressure during use but leave the holes open during washing and thereby results in greater water extraction efficiency during the spinning stage of the washing cycle. The holes are preferably moulded holes and the mat may bear a pile fabric (11) surface.

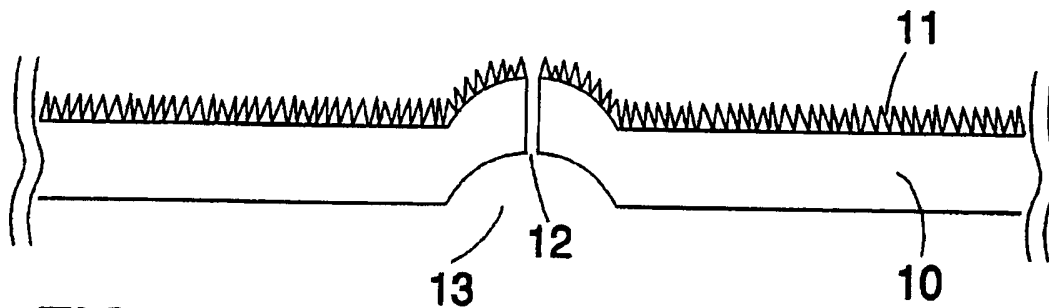


FIGURE 1

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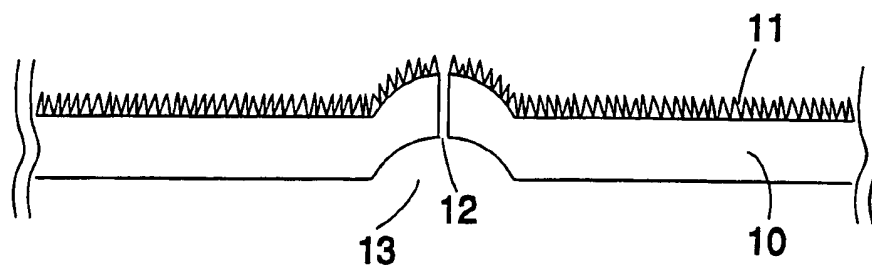


FIGURE 1

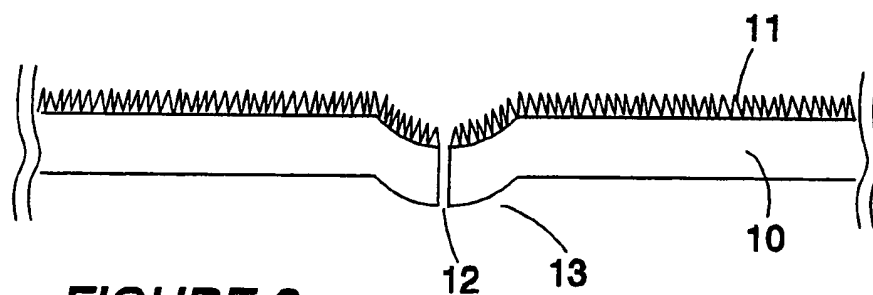


FIGURE 2

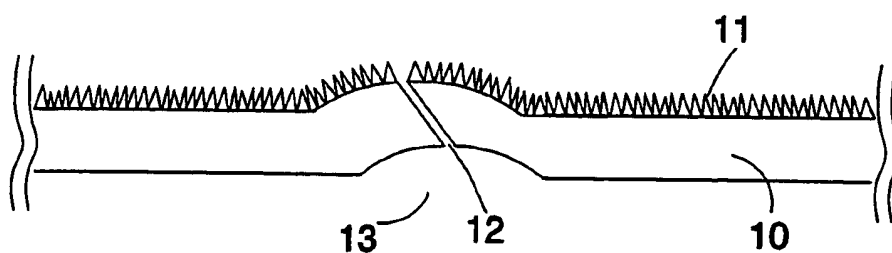


FIGURE 3

- 1 -

WASHABLE FLOOR MATS

The present invention relates to washable floor mats composed of a backing of resilient water-impermeable material such as rubber or plastic, especially those having a pile fabric covering at least part of the upper surface and known as dust control mats.

Examples of the kinds of dust control mats to which the present invention may be applied are described in our earlier GB Patent Specifications Nos. 2115693 and 2195531. The preferred mats with which the invention is concerned are made by needling yarn into a fabric e.g. a non-woven fabric made of plastics fibres fused together, and subsequently bonding the fabric to the backing using heat and pressure. In the case of rubber, the heat also serves to cure the backing. The backing may also be simultaneously provided with moulded projections or cleats designed to inhibit the movement of the mat over underlying carpeted or other surfaces during use.

It is known to provide dust control mats with perforations extending through the water-impermeable backing material. The presence of the perforations is claimed to improve the extraction of water and other fluids during the spin extraction step in the laundering of the mats in washing machines. The perforations are conventionally provided by the use of pins on preformed mats, although it has been proposed to use barbed needles, the pins or needles optionally being heated.

In accordance with one aspect of this invention, a washable floor mat has a backing of resilient water-impermeable material, the backing being provided with holes and projections and/or recesses extending around some or all of the holes. The projections and/or recesses can be on the upper surface of the backing, on the lower surface of the backing or both. Normally the walls of the projections and/or recesses will be sloped to provide a dome or (concave) dish but perpendicular walls can be used. Normally a projection and/or recess will be provided for each hole but there may be two or more holes for a single projection and/or recess which is shaped accordingly e.g. elliptically. The plan-view

shape of the projections and/or recesses is not critical but although irregular, rectangular or square shapes are envisaged, circular or elliptical shapes are preferred.

One principal intended purpose of the projections and/or recesses is to provide a backing in which the holes tend to close in use under the weight of a person stepping on the mat in order to reduce water and dust penetration to the supporting surface. The projections and/or recesses form flexible lips around the upper and/or lower ends of the holes, which lips are squeezed together when a vertical force is applied. A further advantage of using recesses, particularly on the upper surface, is that they assist drainage during the centrifuging stage of the washing cycle thus reducing the likelihood of pockets of water remaining in the fabric.

The invention also includes a process for the production of a washable floor mat comprising a backing of resilient water-impermeable material which includes forming recesses and/or projections therein and subsequently perforating the backing through the recesses and/or projections.

In accordance with a second aspect, the present invention seeks to provide improved perforations in washable floor mats comprising a backing of resilient water-impermeable material. According to this aspect of the invention, these perforations are in the form of moulded holes.

Currently known perforation methods lead to results which are not fully satisfactory. When the perforations are large enough to improve the extraction efficiency significantly they can leak during normal use of the mat, allowing water to pass through when people with wet feet walk over the mats. The water pushed through the backing in normal use onto the underlying floor can cause a slip hazard or rotting or staining of the floor surface. If on the other hand the perforations are small enough to eliminate the leaking then the extraction performance of the mats during laundering is reduced.

The invention also includes a process for the production

of a washable floor mat composed of a backing of resilient water-impermeable material which includes the step of forming moulded holes in the backing during its manufacture.

The water-impermeable backing material may be any of the rubber or resilient plastics materials conventionally used for dust control mats or the like, for example nitrile rubber of hardness 45 to 70, preferably 45 to 55 International Rubber Hardness Degrees. The holes can be formed in the backing during curing, vulcanisation or moulding of the backing in the manufacture of the mat, or can be formed subsequently as described above.

Preferably, a dish shape is formed into the backing in association with the individual holes, suitably on the face of the backing forming the underside of the mat in normal use. This dish shape, which may be circular or elliptical or of other shape and may give either a convex or a concave configuration to the mat in the immediate vicinity of the hole, collapses when pressure is applied to the top surface of the mat in position on a floor surface. As the dish shape collapses, the edges of the hole are pressed together and the hole is sealed against the leaking of water through the backing. However, when the mats are laundered in a washing machine and subjected to spin extraction the dish shape does not collapse and the holes remain open to allow improvements in extraction efficiency as compared to non-perforated mats. The dish shape if concave may aid the flow of water to the hole to assist extraction. The dish shape may for example have a diameter of from about 5 to about 20 mm centred on the hole and a depth of up to about 5 mm.

Moulded holes can be formed in the mat by means of pins which are present during moulding, suitably pins of round section.

Because the holes will be sealed during normal use of the mat on a floor surface they can be relatively large and it is possible to use pins of a size from 0.25 to 4 mm. The holes may pass perpendicularly through the backing material or, if desired, they can be formed at an angle to the perpendicular to improve their closing. The holes can be slot-like, for example 0.25 x 1 mm, in

which case the dish may preferably be oval in shape.

In an alternative but less preferred version of the invention a mat which has already had perforations formed in its resilient backing of water-impermeable material (whether during manufacture of the mat or subsequently) can be provided with projections and/or recesses around the holes. Alternatively, a preformed unperforated mat can be provided simultaneously with perforations and associated projections and/or recesses. In this way some of the benefits of the sealing of the holes by collapse of the projections and/or recesses can be achieved.

The mat may be formed with a napped or tufted pile fabric covering its upper surface, suitably with the exception of a border region, secured to the backing with the aid of an intermediate tissue, as is conventional in dust control mats.

The mat may be manufactured in any conventional or known manner.

The invention is illustrated by the accompanying drawings, in which

Figure 1 is a sketch showing a concave dish and perpendicular moulded hole,

Figure 2 is a sketch showing a convex dish and perpendicular moulded hole, and

Figure 3 is a sketch showing a concave dish and angled moulded hole.

In each figure 10 represents the backing and 11 represents the pile fabric. The hole is shown at 12 and the projections and/or recesses at 13. The pile fabric and the backing are as described above.

CLAIMS

1. A washable floor mat having a backing of resilient water-impermeable material, the backing being provided with holes and projections and/or recesses extending around some or all of the holes.
2. A mat according to claim 1, wherein there are projections and/or recesses on the upper surface of the backing.
3. A mat according to claim 1 or 2, wherein there are projections and/or recesses on the lower surface of the backing.
4. A mat according to any preceding claim, wherein the walls of the projections and/or recesses are sloped.
5. A mat according to claim 4, wherein the projections and/or recesses are in the forms of domes or concave dishes.
6. A mat according to claim 5, wherein the domes or dishes are substantially circular in plan view.
7. A mat according to any preceding claim, wherein there is only one hole for each projection and/or recess.
8. A mat according to any preceding claim, wherein there are recesses on the upper surface of the backing.
9. A mat according to any preceding claim, wherein one or more of the holes is inclined.
10. A mat according to any preceding claim, wherein the holes are moulded holes.

11. A mat according to any preceding claim, wherein the holes have a diameter of 0.25 to 4 mm.

12. A mat according to any preceding claim, wherein pile fabric is bonded to the backing.

13. A mat according to claim 1, substantially as hereinbefore described with reference to, and as illustrated in, Fig. 1, Fig. 2 or Fig. 3 of the drawings.

14. A process for producing a mat according to any preceding claim, which includes forming recesses and/or projections in the backing and subsequently perforating the backing through the recesses and/or projections.

Patents Act 1977**Examiner's report to the Comptroller under Section 17
(The Search report)**Application number
GB 9404911.1**Relevant Technical Fields**

(i) UK Cl (Ed.M) A4S (S1B, S1G, S1N).

(ii) Int Cl (Ed.5) A47L 23/22

Search Examiner
S J QUICKDate of completion of Search
26 MAY 1994**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASES: WPI

Documents considered relevant
following a search in respect of
Claims :-
1-14**Categories of documents**

- X:** Document indicating lack of novelty or of inventive step. **P:** Document published on or after the declared priority date but before the filing date of the present application.
- Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category. **E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A:** Document indicating technological background and/or state of the art. **&:** Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
A	GB 2098861 A	(R NEUBERT) 01.12.82, see Claim 10 and page 2, lines 98-113	-
A	GB 504154	(H V CHAPMAN) 20.04.1939, see Figure 2 (elements 13 and 14)	-
X	EP 0113958 A2	(PROCTOR & GAMBLE) 25.07.84, see especially Figure 4B	1-14
A	US 4589316	(CLEAN-TEX) 20.05.86, see column 2, lines 17-33	-

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).